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Vor Ablauf der für Änderungen der Ansprüche zugelassenen Frist. Veröffentlichung wird wiederholt falls Änderungen eintreffen.

(54) Title: REFUSE CONTAINER, MULTICHAMBER REFUSE CONTAINER IN PARTICULAR

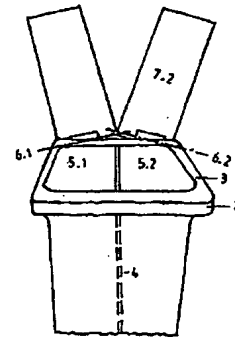
(54) Bezeichnung: MÜLLBEHÄLTER, INSBESONDERE MEHRKAMMER-MÜLLBEHÄLTER

(57) Abstract

The collection of household rubbish in multichamber refuse containers presents difficulties when automatic container grippers are used since the partial lids of refuse containers are no longer opened by hand before the latter are tipped into the vehicle. There is a danger especially with multichamber refuse containers with an inside partition placed perpendicular to the rotational axis of the container, that the partial lid of the latter will collide with the partition wall of the vehicle and fail to open fully during tipping of the container. A multichamber refuse container (1) according to the invention is characterised in that its partial lids (7.1, 7.2) are arranged in such a way that when the container is opened at least one partial lid executes a movement in relation to the plane of partition (4) of the refuse container (1), whereby at least one of the partial lids is displaced so that it spreads away from the partition (4).

(57) Zusammenfassung

Die Hausmüllsammlung mit Mehrkammer-Müllbehältern bereitet bei der Verwendung von automatischen Behältergreifern Schwierigkeiten, da die Teildeckel des Behälters nicht mehr von Hand vor dem Einkippen in das Fahrzeug geöffnet werden können. Insbesondere bei Mehrkammer-Müllbehältern mit einer senkrecht zur Drehachse der Behälterdeckel im Behälter angebrachten Trennwand besteht die Gefahr, dass die Teildeckel des Behälters beim Einkippen des Mülls in das Fahrzeug mit der Trennwand des Fahrzeuges kollidieren und sich daher nicht vollständig öffnen. Der Mehrkammer-Müllbehälter (1) gemäß der Erfindung ist dadurch gekennzeichnet, dass seine Teildeckel (7.1, 7.2) so gelagert sind, dass bei einer Öffnung des Behälters zumindest ein Teildeckel bezüglich der Ebene der Trennwand (4) des Müllbehälters (1) eine Bewegung ausführt, welche zumindest einen der Behälterteildeckel spreizend von der Trennwand (4) wegführt.



# Abstract

The collection of household refuse using multichamber refuse containers poses problems if automatic container grippers are used since the section lids of the container can no longer be opened manually before the container is tipped into the vehicle. In particular in the case of multichamber refuse containers having a partition which is attached perpendicularly to the axis of rotation of the container lid in the container, there is the risk that as the refuse is being tipped into the vehicle, the section lids of the container will collide with the partition of the vehicle and therefore will not open completely. The patent specification proposes various means, such as changing the geometry of the axis of rotation of the section lids, or curved control means attached to the refuse container.



**Refuse container, in particular multichamber refuse container**

10           The invention relates to commercially available  
multichamber refuse containers, or refuse containers  
for which a partition is to be provided, said refuse  
containers generally being made by plastic injection  
15           molding and having an approximately quadrangular cross-  
sectional shape. These divided refuse containers allow  
cost-efficient collection of various types of refuse.

          The emptying of multichamber refuse containers  
takes place in such a manner that the various fractions  
are simultaneously emptied into different filling  
20           chutes of a collection vehicle very feasibly without  
losing any time. This principle is shown for the first  
time in DE 25 58 433 and since then has been introduced  
successfully internationally. If the container having a  
partition (or partitions) is raised up by the lifting  
25           and tipping device and with its filling opening tipped  
downward for emptying, its partition has to be rapidly  
and securely brought against the partition of the  
filling device on the vehicle so that the refuse  
fractions pass safely into the particular storage  
30           spaces in the vehicle. This does not generally pose any  
problems in those refuse containers whose partition  
remain perpendicular during emptying, as long as  
the refuse containers are hooked manually into the  
lifting and tipping device on the vehicle with the lid  
35           or the section lids being opened manually beforehand.

          Problems arise if the loading of the refuse  
containers takes place automatically from the driver's  
cab because the lid or the lids likewise have to be  
opened automatically. The object of the invention is,



in particular in the case of refuse containers having a "longitudinal division", i.e. in which the partition in the refuse container runs perpendicularly to the axis of rotation of the container lid, to find ways and means of enabling the opening to take place without manual intervention, if possible. In this case, care is to be taken that the section lids do not collide with the partition in the vehicle since this would obstruct the opening. The section lids themselves, as seen with respect to each other, thus have to open widely and when the refuse container is closed have to cover the latter in a manner such that they tightly adjoin each other or even overlap so that rain does not penetrate into the container interior, and it should be possible to simultaneously empty all of the compartments of the refuse container. The intention is for this process to be feasible, if possible without those aids which are described in AU-A-17769/95 in which the lid or lids are opened with a water jet, as this can lead to valuable substances in the refuse container being thoroughly soaked and additionally requires a water tank to be carried on the vehicle.

Prior art:

AT 356 003 shows a multichamber refuse container having "a longitudinal division" and individual lids over the chambers, with an overlid ensuring that the container is sealed against the weather. DE G 90 13 881.3 and DE 40 01 717 C2 likewise do not go into the matter of rainproofness and the wide, spread-apart opening of the section lids. In these cases, the individual compartments of the container are emptied separately in a consecutive sequence which in addition is a technical/financial disadvantage in comparison to the compartments being emptied simultaneously. The problem of the simultaneous, wide opening of section lids is likewise not addressed. DE G 90 10 025.5 shows a section lid having a rain channel. However, the manner in which the



section lids are caused to open such that they do not collide with the vehicle partition or tipping partition remains open. SE 501 538 merely gives one reference to fastening the partition. DE 42 00 034 A1 shows two  
5 coupled refuse containers which do actually keep a useful distance apart in the lid region, but this arrangement is expensive and difficult to maneuver in comparison to a single container having a partition. Also DE 35 31 554 A1 having a lid which can be  
10 displaced along its extent does not address the problem and moreover is relatively expensive in production. AU-A-40474/95 shows a slotted lid having a segment which can be pivoted out of the container partition and ensures a tight connection of the container/vehicle  
15 side partitions. In this case too, the matter of weatherproofness is unsolved. US 5,035,563 and US 5,205,698 shows individual variants of DE 25 58 433 and shows a lid fastening on the partition of the refuse container; however, as the  
20 refuse is being tipped out into the vehicle said lid fastening is also subjected to tensile stress, which should be avoided. It is also known to thicken the partition at its upper end and to provide it with a type of rain channel which is intended to ensure that  
25 the rain flows off longitudinally, for example, to the container front and/or rear side. This presupposes an upright positioning of the container at ground level, which rarely happens, and also reduces the size of the filling and emptying opening of the container.

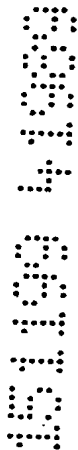
The above discussion of documents, acts, materials, devices, articles and the like is included in the specification solely for the purpose of providing a context for the present invention. It is not suggested or represented that any or all of these matters formed part of the prior art base or were common general knowledge in the field relevant to the present invention as it existed in Australia before the priority date of each claim of this application.



## SUMMARY OF THE INVENTION

According to the invention, there is provided a refuse container having at least two section lids which are mounted on one and the same side of the opening of the container by means of axes of rotation, wherein the axes of rotation form an angle with respect to each other for the carrying out of a spreading movement during the process of opening at least one section lid and/or in that at least one of the section lids has a device for carrying out a transverse movement, directed towards the outside of the container, during the opening process.

It is therefore possible for the first time to arrange the section lids of a refuse container such that they overlap, in fact in a completely weatherproof manner, and nevertheless in the emptying position, i.e. when the container is rotated so that the container opening points downward, the section lids open out far apart so



that the container lids do not collide with the partition in the vehicle and there is virtually no reduction in size of the area of the container opening. The various designs and combinations make possible a solution which is matched to the particular circumstances.

Figure 1 shows a first design of the invention: The refuse container 1 has a collar strip 2 for the incorporation of the refuse container into a known tipping device during emptying ("collar tipping"), and a peripheral, upper container edge 3. The container 1 has a partition 4 which runs from the front to the rear in the container and divides the container into the chambers 5.1 and 5.2 which serve in a known manner to accommodate various types of refuse. The container lid 7 can be opened and closed about an axis of rotation 6. The lid is fastened to the container in a novel manner so that the section lids 7.1 and 7.2 open out with a spreading-apart movement during opening. This happens both when opening manually to fill the container chambers 5.1 and 5.2 and also as the container is being pivoted into the vehicle. This movement apart of the container lids 7.1 and 7.2 is brought about by the lid axes 6.1 and 6.2 which run obliquely with respect to the horizontal and with respect to one another. In this case, the customary transportation handle of the container can also be retained horizontally if the straight line through the external bearing of the lid forms an oblique axis.

Figure 2 shows a rear view of the upper part of a novel refuse container and clarifies the position and fixing of the axes of rotation 6.1 and 6.2 on the refuse container, the transportation handle being positioned obliquely as the axis of rotation of the cover.

Figure 3 shows a plan view of a further design a lid mounting on the container, which mounting ensures a wide, spreading-apart opening of the section lids. In this case, an oblique or helicoidal bearing



surface between the lid fastening and mounting on the container is used. During opening the section lid 7.2 is raised about its axis of rotation 6.2 by means of the container handle 9 over the inclinations 9.1 and 10.1, as shown by the arrows, and is moved apart from the container partition 4. This can likewise be carried out on the other container side, but in this case in a laterally reversed manner.

Of course, a combination of the designs of Figure 1 and 3 results in the section lids 7.1 and 7.2 optimally moving apart during the opening because in this case the section lids are also moved apart in region A (Fig. 2). The section lids can in this manner safely and easily be moved past a partition positioned in the filling region of the vehicle and nevertheless tightly adjoin one another in their inoperative position.

Fig. 5 shows a further novel design of how the section lids can be moved apart during the opening. A curved control in the region of the axis (axes) of rotation of the lid enables the section lids to move apart transversely with respect to the opening movement, the movement in the direction of the axis of rotation being brought about by the interaction of a groove 15 on the rear lid end and a web 16, which is fitted obliquely with respect to the perpendicular of the refuse container, on the upper side of the refuse container. Of course, the groove can also be fitted on the container and the web on the lid.

It is also possible for one of the container lids 7.1 to be provided with elastic or, in particular, interlocking means so that it remains securely closed until emptying of the container in the upside-down position and can be opened in a positively controlled manner, for example by means of a trigger, if it has reached its final position. In this manner, provision is made for the refuse to be separated cleanly and against it being tipped onto the road even when the container is being pivoted into the vehicle opening.



Fig. 4 shows a very simple design of a closure of this type. The elongated hole 11, which preferably runs obliquely forward/downward, on the lid bearing 10 makes possible a relative movement as the lid is being closed (arrow A) and, via the peg 12 and stop 13, closure of the lid during a rotating and tipping movement as the container is being emptied (arrow C). If, for example, the lid 7.1, encounters an obstacle at the end of the process of being pivoted into the opening of the refuse vehicle, it undergoes a movement to the rear (arrow D), thereby unhooks the closure provided by the peg 12 and stop 13 and pivots open. Instead of the pin which is shown it is also possible to use, for example, the lid front edge which retracts under a corresponding mounting.

Of course, a closure of this type may also be of interest for an undivided refuse container having a single lid, in order to avoid pollution during the collection of refuse.

A closure of this type imparts additional support to a partition until the lid is unlocked during the emptying process if at least one lid is designed such that it rests on the partition 4. By this means, the customarily used clip fastenings for the partition are relieved of load and the partition held better.

Since multichamber refuse containers are advantageously produced in such a manner that the partition can at any time subsequently easily be fitted (see EP 0 428 185 B1), it is useful also to provide the invention for those refuse containers which still do not have a partition, so that the lid does not have to be retrofitted if a refuse container is provided with a partition and is to be used as a multichamber refuse container. This only insignificantly increases the costs of producing a refuse container.

Of course, the invention can also be used for those refuse containers which have more than two compartments due to a longitudinal or transverse division.



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Furthermore, the tight closure described can also be used for the safe emptying of refuse containers whose partition runs parallel to the axis of rotation of the lid.



- 1 Refuse container
- 2 Collar strip for holding the container during the emptying
- 3 Peripheral container edge
- 5 4 Partition
- 5.1 Left container chamber
- 5.2 Right container chamber
- 6.1 Left axis of rotation for container lid 7.1
- 6.2 Right axis of rotation for container lid 7.2
- 10 7.1 Left container lid
- 7.2 Right container lid
- 8.1 and 8.2 Left and right lid handle
- 9 Container handle
- 9.1 Inclination on the container handle or on the axis of rotation 6.2
- 15 10 Bearing of the container lid 7.2
- 10.1 Inclination on the bearing 10 of the container lid 7.2
- 11 Elongated hole for the lid fastening
- 20 12 Peg on the lid 7.1
- 13 Stop on the refuse container 1 for lid peg 12
- 14
- 15 Groove on the container lid
- 16 Web on the container



THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. Refuse container having at least two section lids which are mounted on one and the same side of the opening of the container by means of axes of rotation, wherein the axes of rotation form an angle with respect to each other for the carrying out of a spreading movement during the process of opening at least one section lid and/or in that at least one of the section lids has a device for carrying out a transverse movement, directed towards the outside of the container, during the opening process.
2. Refuse container, in particular multichamber refuse container according to claim 1, wherein that the container or at least one section lid has fastening means with which at least one of these section lids is held in a closed position while the refuse container is being pivoted.
3. Refuse container, in particular multichamber refuse container according to claim 2, wherein, as fastening means there are attached to at least one of the section lids pegs, grooves or the like which hold the refuse container in a tightly closed position during the process of pivoting it into the opening of the refuse vehicle.
4. Refuse container according to any one of claims 1 to 3, wherein, in a closed position the section lids overlap and thus prevent the penetration of effects of the weather, such as rain and snow.
5. Refuse container according to any one of claims 1 to 4, wherein, on its lid means are provided, such as specially placed handles or webs which are used for unlocking the lid.
6. Refuse container according to any one of claims 1 to 5, the lid or a part of the lid when closed being configured such that the partition of the refuse container is supported in its position in a form-fitting manner during the process of tipping the container as it is being emptied.



7. Refuse container according to any one of claims 1 to 6, wherein a curved control device is provided for the movement of the lid in a direction from the container center to the opposite container outer side during opening.

5

8. Refuse container according to claim 7, the curved control for the purposeful movement of the container lid from the container center to the opposite container outer side being attached in the region of the lid fastening or between the container lid and container.

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9. Refuse container substantially as herein described with reference to the accompanying drawings.

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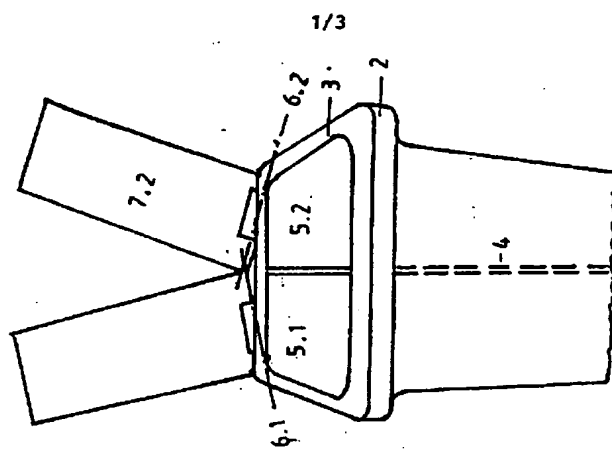


FIG. 1

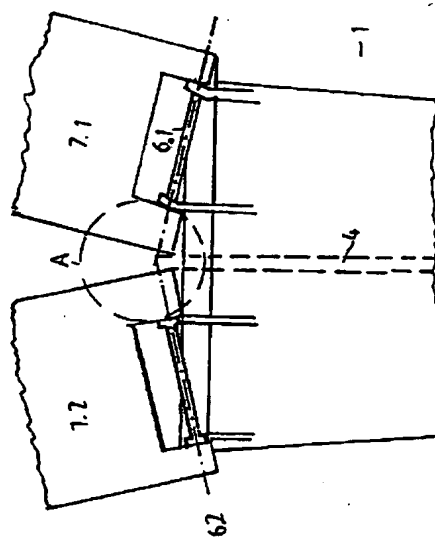


FIG. 2

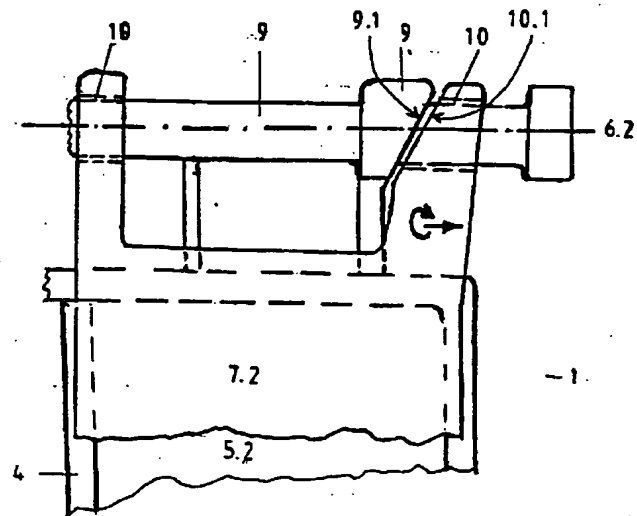


FIG. 3

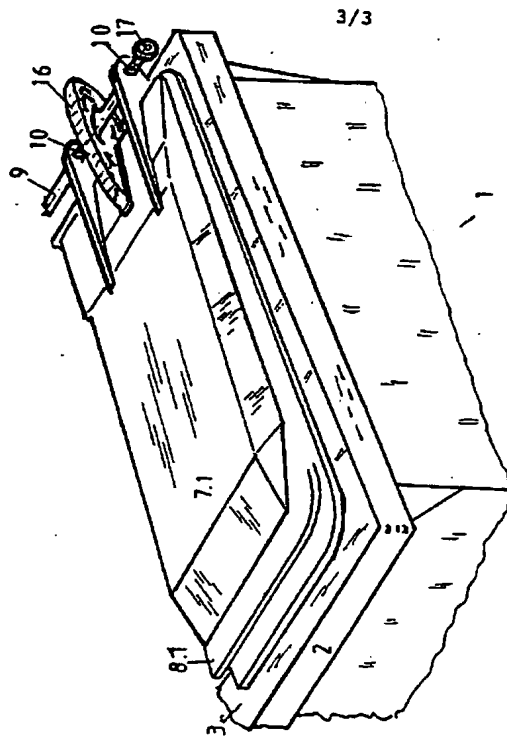


FIG. 5

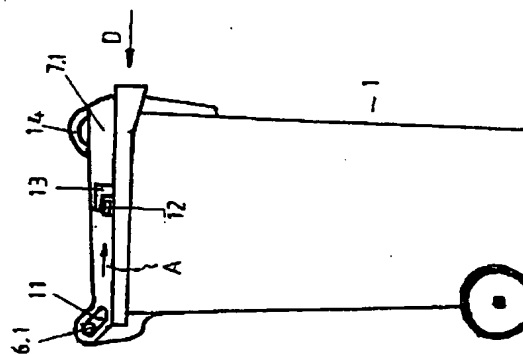


FIG. 4